APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/654,949	09/01/2000	Peter Brittingham	011948-0033-999	7078

20583   7590   01/06/2011
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EXAMINER
WILLIAMS, ROSS A

ART UNIT	PAPER NUMBER
3714	

MAIL DATE	DELIVERY MODE
01/06/2011	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

PTOL-90A (Rev. 04/07)

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
  Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on <u>13 August 2010</u>.

2a)☒ This action is **FINAL**.   2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) <u>1-5,13-16 and 19-33</u> is/are pending in the application.

   4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) <u>1-5,13-16,19 and 20-33</u> is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

   Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

   Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

   a)☐ All   b)☐ Some * c)☐ None of:

   1.☐ Certified copies of the priority documents have been received.

   2.☐ Certified copies of the priority documents have been received in Application No. _____.

   3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

   * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1)☐ Notice of References Cited (PTO-892)

2)☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3)☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.

4)☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.

5)☐ Notice of Informal Patent Application

6)☐ Other: _____.

DETAILED ACTION

Response to Amendment

Claims 1 – 5, 13 – 17 and 19 – 30 are currently pending.

Claims 1, 5 and 13 are amended.

Claims 21 – 30 are newly added.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148

USPQ 459 (1966), that are applied for establishing a background for determining

obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

Claims 1-5, 13-16, and 19 - 30 are rejected under 35 U.S.C. 103(a) as being

unpatentable over Sweitzer et al. (US 6,018,617) in view of "Automatic Generation

of Test Oracles- From Pilot Studies to Application" written by Feather et al.

published 1999.

Regarding Claims 1, 5, 14, 21, 25, 26, 27, 29, 31,32, 33 Sweitzer discloses

obtaining a test item (i.e., problem). See Abstract. Sweitzer discloses creating a test

model by identifying elements of the test item to be variabilized and variabilizing the

elements to create variables in Col.12: 34-37:

> The variation rules may assign substitution variables
> (variables used in the problem layout) or temporary
> variables (variables used only within the variation rules).

Sweitzer discloses defining the variables in Col.12: 49-50:

> Substitution variables are defined using the variation rule
> syntax, which is not case sensitive.

Sweitzer discloses receiving a plurality of constraints for a test item variant,

generating a test item variant (i.e., instance of a problem) of the test item using a

processor by generating values for the variables using a simultaneous constraint solver,

wherein the simultaneous constraint solver resolves one or more constraints pertaining

to variables in Col.12: 41-46:

> To produce an instance of a problem 32, the list of
> variation rules is evaluated sequentially from top to
> bottom. If a constraint is not satisfied, the current pass
> through the list is abandoned and evaluation restarts from
> the top of the list. A valid instance of the problem
> results when the end of the variation rule list is reached.

Sweitzer discloses the use of a constraint solver that solves multiple constraints

in a sequential top-down fashion. Thus Sweitzer does not specifically disclose a

constraint solver that solve for will simultaneously solve multiple constraints at the same

time. However, Feather discloses a method of solving for multiple constraints

simultaneously. Specifically Feather teaches "The planner has to be able to generate

plans; its constraint language is crafted to simultaneously ease the expression of certain

constraints, and limit the form of the expression to those that it can readily handle."

(Feather page4, col 2, par 1).

It would be obvious to one of ordinary skill to modify Sweitzer in view of Feather

to provide a system or method that uses a constraint solver that is able to satisfy or

simultaneously solve for multiple constraints at the same time. The solving of multiple

constraints would obviously provide a reduction in processing time when attempting to

solve the constraints.

Regarding Claims 2, 15, 22, 28 Sweitzer discloses wherein said model creation

further comprises specifying constraints that define a relationship among the variables

in Col.12: 50-53:

> This language supports basic mathematical operations,
> **relational** comparisons, and logical combinations using
> general expressions and operator rotation. Function
> (procedure) references provide extended capabilities.

Regarding Claims 3-4,13, 16, 23, 24 Sweitzer discloses the step of accepting

and retrievably storing the test item variant and the test item model (i.e., instance of a

generalized problem) in Col.11: 57-63 and Col.12: 24-27, 45-46:

> As was discussed above, problem content is created by an
> author who is typically a professional programmer; but may
> be the end user of the test operating software running on
> the personal computer 13. The content of the problem is
> expressed in machine-usable form using the authoring tool
> 30, which stores each problem 32 in a separate file on

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disk.  Problems 32 are organized for easy retrieval in a
single disk file, i.e. one or more problem books 34.  The
set of programs that support collecting problems 32 into
the problem books 34 is referred to as the build tools 70.

Each problem 32 is described by a few key parameters.
These parameters assist the user in selecting problems 32
to include in a worksheet 50.  Problems 32 within each
problem book 34 are grouped into objectives.  Objectives
are grouped into sections and sections are grouped into
chapters.  Problems are not necessarily self-contained.
They may refer to external objects, which are included in
the representation at print time.  Multiple problems can
include the same external object.  These objects are stored
within the problem book 34 file.

The authoring tool 30 and print engine 90, discussed in
greater detail below, use variation rules which are stored
in the variation rules module or engine 80 (FIG. 8) and
define instances of a generalized problem.

A valid instance of the problem results when the end of the
variation rule list is reached.
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Regarding Claim 19, Sweitzer discloses wherein variables can be defined by

values which are variables (e.g., mathematical expressions) in Col.12: 30-32:

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Variables may be replaced with numbers, text, graphics, or
mathematical expressions.
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Regarding Claim 20, Sweitzer discloses wherein the variables are new variables

(e.g., substitution variables, temporary variables) for which new constraints are defined

as needed in Col.12: 34-38:

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The variation rules for a problem 30 are an ordered list of
definitions and constraints expressed in a simple language.
The variation rules may assign substitution variables
(variables used in the problem layout) or temporary
variables (variables used only within the variation rules).
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> The variation rules may also impose constraints on the
> relationship between variables.

Claim 17 and 30 is rejected under 35 U.S.C. 103(a) as being unpatentable over Sweitzer et al. (US 6,018,617) in view of "Automatic Generation of Test Oracles- From Pilot Studies to Application" written by Feather et al. circa 1999.

Regarding claim 17 and 30, Sweitzer does not disclose expressly wherein the test item model constraints are simultaneously solved using PROLOG IV and Test Creation Assistant constraint language. Instead, Sweitzer discloses the use of C++ in Col.6: 28-39 and variation rules language to simultaneously solve test item model constraints in Col.10: 61-63.

At the time the invention was made, it would have been an obvious matter of design choice to a person of ordinary skill in the art to use C++ and variation rules language to simultaneously solve test item model constraints because Applicant has not disclosed that using PROLOG IV and Test Creation Assistant constraint language, is used for a particular purpose, or solves a stated problem. One of ordinary skill in the art, furthermore, would have expected Sweitzer's invention, and applicant's invention, to perform equally well with either the languages taught by Sweitzer or the languages claimed by Applicant because both languages would perform the same function of generating multiple instances of a test item.

Therefore, it would have been prima facie obvious to modify Sweitzer to obtain the invention as specified in claim 17 because such a modification would have been

considered a mere design consideration which fails to patentably distinguish over the

prior art of Sweitzer.

Response to Arguments

Applicant's arguments filed 8/13/10 have been fully considered but they are not

persuasive. Applicant argues "claim 1 requires consideration of the constraints in

.generating values for the variables. Such a configuration offers time savings over the

Sweitzer method which randomly picks variable values and then sequentially checks

those variables. In contrast, the method of claim 1 ensures that the constraints are

satisfied in the single step of generating values for the variables using the simultaneous

constraint solver. Feather does not make up for this missing teaching in Sweitzer. Page

4, col. 2, paragraph 1 of Feather cited by the Office does not teach a method for solving

multiple constraints simultaneously. The cited portion of Feather describes relaxing

constraints, such that those constraints do not necessarily need to be satisfied. The

cited portion of Feather does not teach generation of values for variables at all, let alone

generating values for the variables using a simultaneous constraint solver."

The Examiner respectfully disagrees and states that the constraint solver of

Swietzer must at some point generate values for the variables in order to solve the

constraints albeit in a sequential fashion during the resolving process.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to ROSS A. WILLIAMS whose telephone number is 571-272-5911. The examiner can normally be reached on Mon-Fri 8:30-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ronald Laneau can be reached on 571-272-6784. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the

Patent Application Information Retrieval (PAIR) system. Status information for

published applications may be obtained from either Private PAIR or Public PAIR.

Status information for unpublished applications is available through Private PAIR only.

For more information about the PAIR system, see http://pair-direct.uspto.gov. Should

you have questions on access to the Private PAIR system, contact the Electronic

Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a

USPTO Customer Service Representative or access to the automated information

system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/R. A. W./
Examiner, Art Unit 3714
10/18/10

/Ronald Laneau/
Primary Examiner, Art Unit 3714